AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions of the claims in the Application. With reference to the listing it is noted that, herewith, claims 2, 3, 6-11, 13, 14, and 18-22 are amended.

Listing of Claims

1. (Cancelled)

2. (Currently Amended) A photoelectric conversion device comprising:

a photoelectric converter ~~conversion means~~ including a plurality of photoelectric conversion elements each of which is constructed by a plurality of pixels on a semiconductor substrate;

a plurality of storage ~~means~~ elements arranged on the same semiconductor substrate, each ~~for~~ storing predetermined control information ~~for~~ employable in controlling a corresponding one of said photoelectric conversion elements, wherein each of said plurality of storage ~~means~~ elements includes rewritable memory of which control information ~~for~~ employable in controlling an operation of said photoelectric conversion element is rewritable by a predetermined program stored in a program memory; and

~~control means~~ a controller, ~~for controlling~~ wherein said controller controls charge accumulation of said photoelectric ~~conversion means~~ converter on the basis of the control information stored in said storage ~~means~~ elements.

3. (Currently Amended) The device according to claim 2, wherein said photoelectric converter

~~conversion means~~ further includes ~~monitor means~~ a monitor, ~~for monitoring~~ wherein said monitor monitors an accumulated charge state in said photoelectric conversion element, and

said ~~control means~~ controller includes ~~selection means~~ a selector, wherein said selector selects ~~for selecting~~ an arbitrary one of a plurality of pieces of status information on the basis of the control information stored in said storage ~~means~~ elements, and a comparator ~~comparison means~~, wherein said comparator ~~for comparing~~ compares an output from said ~~monitor means~~ monitor with the status information selected by said ~~selection means~~ selector, and controls the charge accumulation of said photoelectric ~~conversion means~~ converter on the basis of a comparison result of said ~~comparison means~~ comparator.

4. (Withdrawn) A photoelectric conversion device comprising: photoelectric conversion means including a photoelectric conversion element constructed by a plurality of pixels, and storage means for storing predetermined control information;

read means for amplifying an accumulated charge signal of said photoelectric conversion element with a predetermined amplification factor, and reading out the amplified signal; and

control means for controlling the amplification factor of said read means on the basis of the control information stored in said storage means.

5. (Withdrawn) The device according to claim 4, wherein said photoelectric conversion means further includes monitor means for monitoring an accumulated charge state in said photoelectric conversion element, and

said control means includes selection means for selecting an arbitrary one of a plurality of pieces of status information on the basis of the control information stored in said storage means,

and comparison means for comparing an output from said monitor means with the status information selected by said selection means, and controls the amplification factor of said read means on the basis of a comparison result of said comparison means.

6. (Currently Amended) The device according to claim 2, further comprising a plurality of photoelectric ~~conversion means~~ converters equivalent to said photoelectric ~~conversion means~~ converter.

7. (Currently Amended) The device according to claim 3, wherein said monitor ~~means~~ monitors and outputs information based on a maximum accumulated charge amount of said photoelectric conversion element.

8. (Currently Amended) The device according to claim 3, wherein said ~~control means~~ controller stores the status information selected by said ~~selection means~~ selector in said storage ~~means~~ elements as the control information.

9. (Currently Amended) The device according to claim 2, wherein said photoelectric ~~conversion means~~ converter is constructed by forming said photoelectric conversion element and storage ~~means~~ elements on a single substrate.

10. (Currently Amended) The device according to claim 2, wherein said ~~control means~~ controller includes a circuit, ~~determination means for~~ wherein said circuit determines ~~determining~~ predetermined information on the basis of said output from said monitor ~~means~~, and stores the information determined by said ~~determination means~~ circuit in said storage ~~means~~ elements as

the control information.

11. (Currently Amended) The device according to claim 3, wherein said ~~control means~~ controller includes ~~determination means~~ a circuit, wherein said circuit determines ~~for determining~~ predetermined information on the basis of said output from said monitor ~~means~~, and stores the information determined by said ~~determination means~~ circuit in said storage ~~means~~ elements as the control information.

12. (Cancelled)

13. (Currently Amended) The method according to claim 14, ~~wherein the control step includes~~ further comprising:

~~the monitor output step of~~ monitoring and outputting an accumulated charge state in said photoelectric conversion element;

~~the selection step of~~ selecting an arbitrary one of a plurality of pieces of status information on the basis of the control information read out from said memory;

~~the comparison step of~~ comparing the outputted accumulated charge state ~~an output in the monitor output step~~ with the selected status information ~~selected in the selection step~~; and

~~the accumulation control step of~~ controlling the charge accumulation of said photoelectric conversion element on the basis of a comparison result of said comparing ~~in the comparison step~~.

14. (Currently Amended) A method of controlling charge accumulation of a plurality of photoelectric conversion elements each of which is constructed by a plurality of pixels,

comprising:

~~the control step of~~ reading out respective control information from a plurality of memories each of which is corresponding to respective one of said photoelectric conversion elements, and respectively controlling the charge accumulation of each of said photoelectric conversion elements on the basis of respective control information, wherein ~~the control step includes the step of controlling~~ charge accumulation operations of a plurality of photoelectric converters ~~conversion means equivalent to said photoelectric conversion means~~ are controlled on the basis of control information in a plurality of memories ~~equivalent to said memory~~; and

~~a rewriting step for~~ rewriting respective control information ~~for~~ employable in controlling an operation of said photoelectric conversion element in said plurality of memories by a program stored in a program memory.

15. (Withdrawn) A method of controlling operation for reading out an accumulated charge signal from a photoelectric conversion element constructed by a plurality of pixels while applying the signal with a predetermined amplification factor, comprising:

the control step of reading out control information from a memory corresponding to said photoelectric conversion element, and controlling the amplification factor on the basis of the control information.

16. (Withdrawn) The method according to claim 15, wherein the control step includes:

the monitor output step of monitoring and outputting an accumulated charge state in said photoelectric conversion element;

the selection step of selecting an arbitrary one of a plurality of pieces of status

information on the basis of the control information read out from said memory;

the comparison step of comparing an output in the monitor output step with the status information selected in the selection step; and

the amplification factor control step of controlling the amplification factor on the basis of a comparison result in the comparison step.

17. (Withdrawn) The method according to claim 15, wherein the control step includes the step of controlling the amplification factors of accumulated charge signals read out from a plurality of photoelectric conversion means equivalent to said photoelectric conversion means on the basis of control information in a plurality of memories equivalent to said memory.

18. (Currently Amended) The method according to claim 13, ~~wherein the monitor output step includes the step of~~ further comprising monitoring and outputting information based on a maximum accumulated charge amount of said photoelectric conversion element.

19. (Currently Amended) The method according to claim 13, ~~wherein the control step includes the step of~~ further comprising storing the selected status information ~~selected in the selection step~~ in said memory as the control information.

20. (Currently Amended) The method according to claim 14, ~~wherein the control step includes~~ further comprising ~~the determination step of~~ determining predetermined information on the basis of an accumulated charge signal read out from said photoelectric conversion element, and ~~the storage step of~~ storing the determined information ~~determined in the determination step~~ in said memory as the control information.

21. (Currently Amended) A focus detection device including a photoelectric conversion device of claim 2.

22. (Currently Amended) A storage medium which computer-readably stores ~~the processing steps of~~ program code corresponding to a control method of claim 14.

23. (Withdrawn) A photoelectric conversion device comprising:

a plurality of photoelectric conversion elements, which are divided into a plurality of regions;

accumulation start means for making said photoelectric conversion elements in the plurality of regions start accumulation;

monitoring means for monitoring and outputting accumulation states of the photoelectric conversion elements in the respective regions in turn;

determination means for comparing each of the monitor outputs output in turn with a predetermined value to determine if the accumulation of the photoelectric conversion element in the region corresponding to the monitor output is to end; and

accumulation end means for, when said determination means determines that the accumulation is to end, ending the accumulation of the photoelectric conversion element in the region corresponding to the monitor output,

wherein said monitoring means monitors and outputs the accumulation states in the respective regions at a predetermined time interval in turn, and makes the predetermined time interval different between a timing immediately after the beginning of the accumulation and a

timing a certain period of time after the beginning of the accumulation.

24. (Withdrawn) The device according to claim 23, wherein a plurality of photoelectric conversion elements equivalent to said photoelectric conversion elements are located in each of the plurality of regions.

25. (Withdrawn) The device according to claim 23, wherein said plurality of photoelectric conversion elements construct an area sensor having a continuous, two-dimensional distribution.

26. (Withdrawn) The device according to claim 23, wherein the monitor output corresponds to a signal based on a maximum accumulated charge amount of the photoelectric conversion elements included in each region.

27. (Withdrawn) The device according to claim 23, wherein said monitoring means makes the predetermined time interval different by inserting a wait time at a timing of the monitor output.

28. (Withdrawn) The device according to claim 23, wherein said monitoring means makes the predetermined time interval different by changing a clock signal for controlling a timing of the monitor output.

29. (Withdrawn) A focus detection device comprising:

a plurality of photoelectric conversion elements, which are divided into a plurality of regions;

accumulation start means for making said photoelectric conversion elements in the

plurality of regions start accumulation;

monitoring means for monitoring and outputting accumulation states of the photoelectric conversion elements in the respective regions in turn;

determination means for comparing each of the monitor outputs output in turn with a predetermined value to determine if the accumulation of the photoelectric conversion element in the region corresponding to the monitor output is to end;

accumulation end means for, when said determination means determines that the accumulation is to end, ending the accumulation of the photoelectric conversion element in the region corresponding to the monitor output;

pixel read means for reading out pixels of the respective divided regions; and

detection means for performing focus detection of an object by calculating pixel signals read out by said pixel read means,

wherein said monitoring means monitors and outputs the accumulation states in the respective regions at a predetermined time interval in turn, and makes the predetermined time interval different between a timing immediately after the beginning of the accumulation and a timing a certain period of time after the beginning of the accumulation.

30. (Withdrawn) The device according to claim 29, wherein a plurality of photoelectric conversion elements equivalent to said photoelectric conversion elements are located in each of the plurality of regions.

31. (Withdrawn) The device according to claim 29, wherein said plurality of photoelectric

conversion elements construct an area sensor having a continuous, two-dimensional distribution.

32. (Withdrawn) The device according to claim 29, wherein the monitor output corresponds to a signal based on a maximum accumulated charge amount of the photoelectric conversion elements included in each region.

33. (Withdrawn) The device according to claim 29, wherein said monitoring means makes the predetermined time interval different by inserting a wait time at a timing of the monitor output.

34. (Withdrawn) The device according to claim 29, wherein said monitoring means makes the predetermined time interval different by changing a clock signal for controlling a timing of the monitor output.

35. (Withdrawn) A method of controlling a photoelectric conversion device which comprises a plurality of photoelectric conversion elements, which are divided into a plurality of regions, accumulation start means for making said photoelectric conversion elements in the plurality of regions start accumulation, monitoring means for monitoring and outputting accumulation states of the photoelectric conversion elements in the respective regions in turn, determination means for comparing each of the monitor outputs output in turn with a predetermined value to determine if the accumulation of the photoelectric conversion element in the region corresponding to the monitor output is to end, and accumulation end means for, when said determination means determines that the accumulation is to end, ending the accumulation of the photoelectric conversion element in the region corresponding to the monitor output,

wherein said monitoring means monitors and outputs the accumulation states in the

respective regions at a predetermined time interval in turn, and makes the predetermined time interval different between a timing immediately after the beginning of the accumulation and a timing a certain period of time after the beginning of the accumulation.

36. (Withdrawn) The method according to claim 35, wherein a plurality of photoelectric conversion elements equivalent to said photoelectric conversion elements are located in each of the plurality of regions.

37. (Withdrawn) The method according to claim 35, wherein said plurality of photoelectric conversion elements construct an area sensor having a continuous, two-dimensional distribution.

38. (Withdrawn) The method according to claim 35, wherein the monitor output corresponds to a signal based on a maximum accumulated charge amount of the photoelectric conversion elements included in each region.

39. (Withdrawn) The method according to claim 35, wherein said monitoring means makes the predetermined time interval different by inserting a wait time at a timing of the monitor output.

40. (Withdrawn) The method according to claim 35, wherein said monitoring means makes the predetermined time interval different by changing a clock signal for controlling a timing of the monitor output.

41. (Withdrawn) A method of controlling a focus detection device which comprises a plurality of photoelectric conversion elements, which are divided into a plurality of regions, accumulation

start means for making said photoelectric conversion elements in the plurality of regions start accumulation, monitoring means for monitoring and outputting accumulation states of the photoelectric conversion elements in the respective regions in turn, determination means for comparing each of the monitor outputs output in turn with a predetermined value to determine if the accumulation of the photoelectric conversion element in the region corresponding to the monitor output is to end, accumulation end means for, when said determination means determines that the accumulation is to end, ending the accumulation of the photoelectric conversion element in the region corresponding to the monitor output, pixel read means for reading out pixels of the respective divided regions, and detection means for performing focus detection of object by calculating pixel signals read out by said pixel read means,

wherein said monitoring means monitors and outputs the accumulation states in the respective regions at a predetermined time interval in turn, and makes the predetermined time interval different between a timing immediately after the beginning of the accumulation and a timing a certain period of time after the beginning of the accumulation.

42. (Withdrawn) The method according to claim 41, wherein a plurality of photoelectric conversion elements equivalent to said photoelectric conversion elements are located in each of the plurality of regions.

43. (Withdrawn) The method according to claim 41, wherein said plurality of photoelectric conversion elements construct an area sensor having a continuous, two-dimensional distribution.

44. (Withdrawn) The method according to claim 41, wherein the monitor output corresponds to a signal based on a maximum accumulated charge amount of the photoelectric conversion

elements included in each region.

45. (Withdrawn) The method according to claim 41, wherein said monitoring means makes the predetermined time interval different by inserting a wait time at a timing of the monitor output.

46. (Withdrawn) The method according to claim 41, wherein said monitoring means makes the predetermined time interval different by changing a clock signal for controlling a timing of the monitor output.

47. (Withdrawn) A storage medium that stores a control program for controlling a photoelectric conversion device which comprises a plurality of photoelectric conversion elements, which are divided into a plurality of regions, accumulation start means for making said photoelectric conversion elements in the plurality of regions start accumulation, monitoring means for monitoring and outputting accumulation states of the photoelectric conversion elements in the respective regions in turn, determination means for comparing each of the monitor outputs output in turn with a predetermined value to determine if the accumulation of the photoelectric conversion element in the region corresponding to the monitor output is to end, and accumulation end means for, when said determination means determines that the accumulation is to end, ending the accumulation of the photoelectric conversion element in the region corresponding to the monitor output, said control program having:

a code of the step of controlling said monitoring means to monitor and output the accumulation states in the respective regions at a predetermined time interval in turn, and to make the predetermined time interval different between a timing immediately after the beginning of the accumulation and a timing a certain period of time after the beginning of the

accumulation.

48. (Withdrawn) The medium according to claim 47, wherein a plurality of photoelectric conversion elements equivalent to said photoelectric conversion elements are located in each of the plurality of regions.

49. (Withdrawn) The medium according to claim 47, wherein said plurality of photoelectric conversion elements construct an area sensor having a continuous, two-dimensional distribution.

50. (Withdrawn) The medium according to claim 47, wherein the monitor output corresponds to a signal based on a maximum accumulated charge amount of the photoelectric conversion elements included in each region.

51. (Withdrawn) The medium according to claim 47, wherein said monitoring means makes the predetermined time interval different by inserting a wait time at a timing of the monitor output.

52. (Withdrawn) The medium according to claim 47, wherein said monitoring means makes the predetermined time interval different by changing a clock signal for controlling a timing of the monitor output.

53. (Withdrawn) A storage medium that stores a control program for controlling a focus detection device which comprises a plurality of photoelectric conversion elements, which are divided into a plurality of regions, accumulation start means for making said photoelectric conversion elements in the plurality of regions start accumulation, monitoring means for

monitoring and outputting accumulation states of the photoelectric conversion elements in the respective regions in turn, determination means for comparing each of the monitor outputs output in turn with a predetermined value to determine if the accumulation of the photoelectric conversion element in the region corresponding to the monitor output is to end, accumulation end means for, when said determination means determines that the accumulation is to end, ending the accumulation of the photoelectric conversion element in the region corresponding to the monitor output, pixel read means for reading out pixels of the respective divided regions, and detection means for performing focus detection of an object by calculating pixel signals read out by said pixel read means, said control program having:

a code of the step of controlling said monitoring means to monitor and output the accumulation states in the respective regions at a predetermined time interval in turn, and to make the predetermined time interval different between a timing immediately after the beginning of the accumulation and a timing a certain period of time after the beginning of the accumulation.

54. (Withdrawn) The medium according to claim 53, wherein a plurality of photoelectric conversion elements equivalent to said photoelectric conversion elements are located in each of the plurality of regions.

55. (Withdrawn) The medium according to claim 53, wherein said plurality of photoelectric conversion elements construct an area sensor having a continuous, two-dimensional distribution.

56. (Withdrawn) The medium according to claim 53, wherein the monitor output corresponds to a signal based on a maximum accumulated charge amount of the photoelectric conversion

elements included in each region.

57. (Withdrawn) The medium according to claim 53, wherein said monitoring means makes the predetermined time interval different by inserting a wait time at a timing of the monitor output.

58. (Withdrawn) The medium according to claim 53, wherein said monitoring means makes the predetermined time interval different by changing a clock signal for controlling a timing of the monitor output.